

**COLORADO RIVER BOARD OF CALIFORNIA**

770 FAIRMONT AVENUE, SUITE 100  
GLENDALE, CA 91203-1068  
(818) 500-1625  
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January 28, 2010

**NOTICE OF REGULAR MEETING OF THE  
COLORADO RIVER BOARD**

**NOTICE IS HEREBY GIVEN** pursuant to the call of the Chairperson, Dana B. Fisher, Jr., by the undersigned, the Acting Executive Director of the Colorado River Board of California, that a regular meeting of the Board Members is to be held as follows:

Date: February 9, 2011, Wednesday
Time: 10:00 a.m.
Place: Vineyard Room
Holiday Inn Ontario Airport
2155 East Convention Center Way
Ontario, CA 91764-4452
TEL: (909) 212-8000, FAX: (909) 418-6703

The Colorado River Board of California welcomes any comments from members of the public pertaining to items included on this agenda and related topics. Oral comments can be provided at the beginning of each Board meeting; while written comments may be sent to Mr. Dana B. Fisher, Jr., Chairperson, Colorado River Board of California, 770 Fairmont Avenue, Suite 100, Glendale, California, 91203-1068.

An Executive Session may be held in accordance with provisions of Article 9 (commencing with Section 11120) of Chapter 1 of Part 1 of Division 3 of Title 2 of the Government Code and in accordance with Sections 12516 and 12519 of the Water Code to discuss matters concerning interstate claims to the use of Colorado River System waters in judicial proceedings, administrative proceedings, and/or negotiations with representatives from other states or the federal government.

Requests for additional information may be directed to: Christopher S. Harris, Acting Executive Director, Colorado River Board of California, 770 Fairmont Avenue, Suite 100, Glendale, CA 91203-1068, or 818-500-1625. A copy of this Notice and Agenda may be found on the Colorado River Board's web page at [www.crb.ca.gov](http://www.crb.ca.gov).

A copy of the meeting agenda, showing the matters to be considered and transacted, is attached.

/S/

Christopher S. Harris  
Acting Executive Director

attachment: Agenda

Regular Meeting  
COLORADO RIVER BOARD OF CALIFORNIA  
February 9, 2011, Wednesday  
10:00 a.m.

Vineyard Room  
Holiday Inn Ontario Airport  
2155 East Convention Center Way  
Ontario, CA 91764-4452

## A G E N D A

At the discretion of the Board, all items appearing on this agenda, whether or not expressly listed for action, may be deliberated upon and may be subject to action by the Board. Items may not necessarily be taken up in the order shown.

1. Call to Order
2. Opportunity for the Public to Address the Board (Limited to 5 minutes)  
As required by Government Code, Section 54954.3(a)
3. Administration
  - a. Minutes of the Meeting Held January 12, 2010,  
Consideration and Approval (**Action**) [ ] [ ] [ ] [ ] [ ] [ ] [ ] [ ] [ ] [ ] TAB 1
4. Agency Managers Meetings
5. Protection of Existing Rights
  - a. Colorado River Water Report(s) [ ] . TAB  
2  
Report from Board Staff on current reservoir storage, reservoir releases, projected water use, forecasted river flows, scheduled deliveries to Mexico, and salinity
  - b. State and Local Water Reports [ ] ... TAB 3  
Reports from Board members on current water supply and use conditions
  - c. Colorado River Operations [ ] . TAB 4
    - Government Accountability Office's Report "A Better and Coordinated Understanding of Water Resources Could Help Mitigate the Impacts of Potential Oil Shale Development"
    - WGA/WSWC and CDWR Workshop on "Climate Impacts on Extreme Events" San Diego, California, March 21-23, 2011
  - d. Basin States Discussions
    - Status of the Colorado River Basin Water Study Report
  - e. Colorado River Environmental Issues [ ] TAB 5
    - Reclamation's Draft Environmental Assessment "Development and Implementation of a Protocol for High-Flow Experimental Releases from Glen Canyon Dam, Arizona, 2011-2020"

## Agenda (continued)

## 6. Water Quality

- a. Status of Hexavalent Chromium Groundwater Contamination Cleanup at the PG&E Topock Gas Compression Station Site □ □ □ □ □ □ □ □ □ □ □ □ □ □ .. TAB 6
- b. Status of Perchlorate Contamination Cleanup at the Las Vegas Wash

## 7. Executive Session

An Executive Session may be held by the Board pursuant to provisions of Article 9 (commencing with Section 11120) of Chapter 1 of Part 1 of Division 3 of Title 2 of the Government Code and Sections 12516 and 12519 of the Water Code to discuss matters concerning interstate claims to the use of Colorado River system waters in judicial proceedings, administrative proceedings, and/or negotiations with representatives from other states or the federal government.

## 8. Other Business

- a. Next Board Meeting: Regular Meeting  
March 9, 2011, Wednesday, starting 10:00 a.m.  
Holiday Inn Ontario Airport  
2155 East Convention Center Way  
Ontario, CA 91764-4452  
TEL: (909) 212-8000, FAX: (909) 418-6703

3.a. - Approval January 12, 2011. Board Meeting Minutes

5.a. - Colorado River Water Reports

**SUMMARY WATER REPORT  
COLORADO RIVER BASIN  
January 31, 2011**

	MAF	ELEV. IN FEET	% of Capacity	January 3, 2011		
				MAF	ELEV. IN FEET	% of Capacity
<b>RESERVOIR STORAGE</b> (as of January 30)						
Lake Powell	13.852	3,620.8	57	14.442	3,026.3	59
Flaming Gorge	3.112	6,023.7	83	3.110	6,023.6	83
Navajo	1.343	6,059.6	79	1.360	6,061.0	80
Lake Mead	10.758	1,091.7	42	10.300	1,086.3	40
Lake Mohave	1.663	641.7	92	1.682	642.4	93
Lake Havasu	0.547	446.2	88	0.577	442.3	93
<b>Total System Storage</b>	32.141		54	32.362		54
<b>System Storage Last Year</b>	33.087		55	33.125		56

January 3, 2011			
WY 2011 Precipitation (Basin Weighted Avg) 10/01/10 through 1/31/11	128 percent (15.6")	148 percent (13.6")	
WY 2011 Snowpack Water Equivalent (Basin Weighted Avg) on day of 1/31/11 (Above two values based on average of data from 116 sites.)	123 percent (13.5")	147 percent (11.2")	
January 3, 2011			
January 13, 2011 Forecast of Unregulated Lake Powell Inflow	MAF	% of Normal	MAF % of Avg.
2011 April through July unregulated inflow	9.300	117 %	9.500 120%
2011 Water Year forecast	12.994	108 %	13.194 110%

USBR Forecasted Year-End 2010 and 2009 Consum. Use, January 4, 2011 a./				
		MAF		
		2010	2009	
	Diversion - Return =	Net		
Nevada (Estimated Total)	0.454 0.211	0.243	0.249	
Arizona (Total)	3.615 0.822	2.792	2.829	
CAP Total		1.653	1.660	
Az. Water Banking Authority		0.134	0.134	
OTHERS		1.140	1.169	
California (Total) b./	5.010 0.646	4.363	4.364	
MWD		1.099	1.105	
3.85 Agriculture	Total Conserved	Forecasted	Estimated	
IID c./	2.907 -0.360	2.547	2.572	
CVWD d./	0.335 -0.031	0.304	0.309	
PVID	0.274 0	0.274	0.285	
YPRD	0.039 0	0.039	0.038	
Island e./	0.006 0	0.006	0.006	
Total Ag.	3.561 -0.391	3.170	3.210	
Others		0.094	0.049	
PVID-MWD following to storage (to be determined)		--	0	
<b>Arizona, California, and Nevada Total f./</b>	<b>9.078 1.680</b>	<b>7.399</b>	<b>7.442</b>	

a./ Incorporates Jan.- Nov. USGS monthly data and 75 daily reporting stations which may be revised after provisional data reports are distributed by USGS. Use to date estimated for users reporting monthly and annually.

b./ California 2010 basic use apportionment of 4.4 MAF has been adjusted to 4.271 MAF for payback of inadvertent Overrun and Payback Policy overruns (-2,189 AF), MWD recovery of interstate underground storage from Arizona (8,159), Creation of Extraordinary Conservation ICS by IID (-1,500 AF), Creation of Extraordinary Conservation ICS by MWD (-133,000 AF).

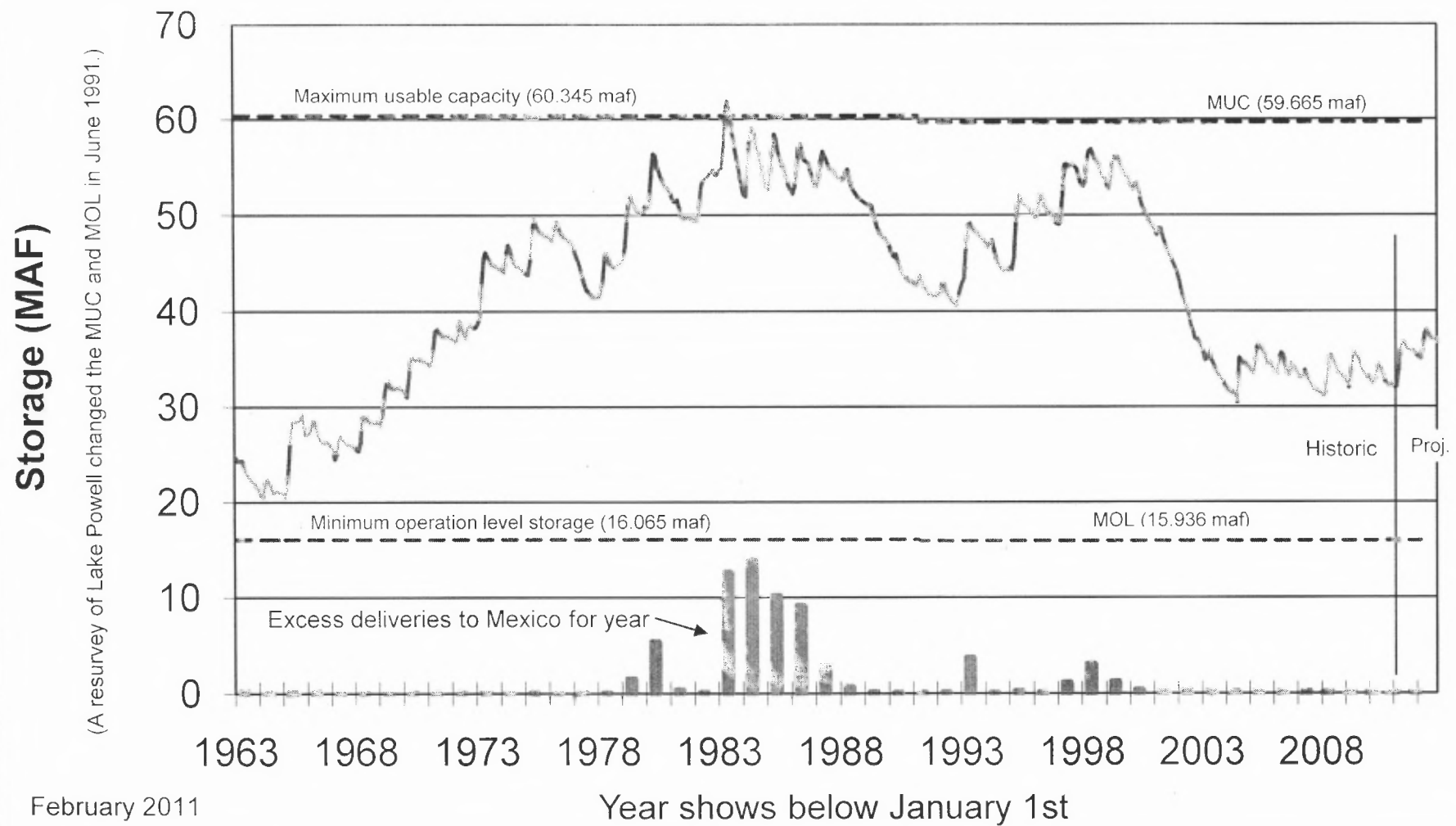
c./ 0.105 MAF conserved by IID-MWD Agreement as amended in 2007: 105,000 AF conserved for SDCWA under the IID-SDCWA Transfer Agreement as amended, 70,000 AF of which is being diverted by MWD; 12,000 AF required to conserved for CVWD under the IID-CVWD Acquisition Agreement, 67,700 AF conserved by the All-American Canal Lining Project.

d./ 30,850 acre-feet conserved by the Coachella Canal Lining Project.

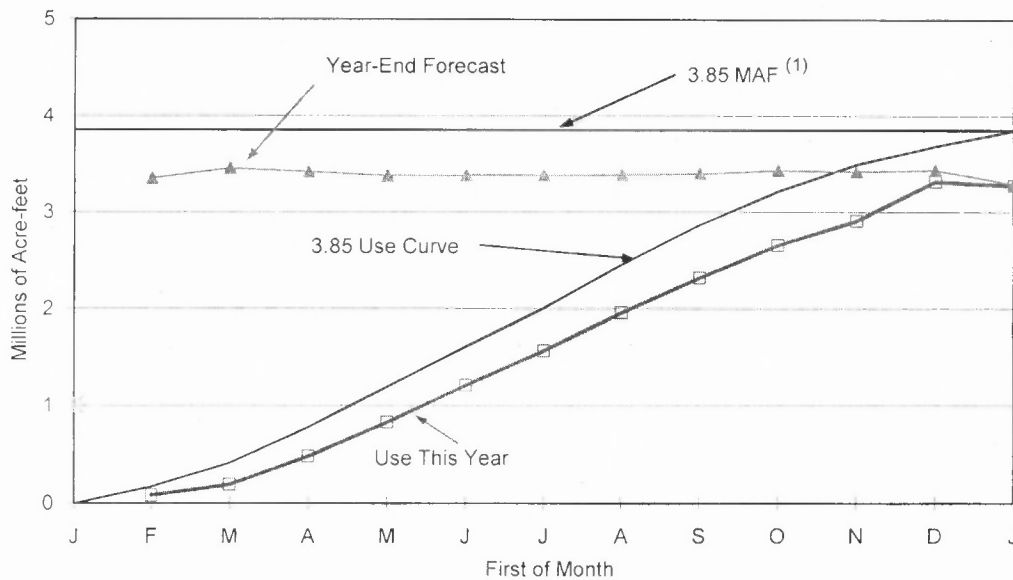
e./ Includes estimated amount of 6,470 acre-feet of disputed uses by Yuma Island pumpers and 0 acre-feet by Yuma Project Ranch 5 being charged by USBR to Priority 2.

f./ Includes unmeasured returns based on estimated consumptive use/diversion ratios by user from studies provided by Arizona Dept. of Water Resources, Colorado River Board of California, and Reclamation.

# Monthly Total Colorado River Basin Storage



**FIGURE 1**  
**FEBRUARY 1, 2011 FORECAST OF 2010 YEAR-END COLORADO RIVER WATER USE**  
**BY THE CALIFORNIA AGRICULTURAL AGENCIES**



Month	Use as of First of Month	Forecast of Year End Use	Forecast of Unused Water (1)
Jan	0.000	-----	-----
Feb	0.084	3.352	0.145
Mar	0.192	3.456	0.041
Apr	0.479	3.421	0.075
May	0.826	3.378	0.118
Jun	1.208	3.381	0.116
Jul	1.561	3.382	0.114
Aug	1.958	3.389	0.108
Sep	2.320	3.398	0.098
Oct	2.658	3.435	0.061
Nov	2.910	3.422	0.075
Dec	3.317	3.436	0.061
Jan	3.277	3.292	0.204

(1) The forecast of unused water is based on the availability of 3.496 MAF under the first three priorities of the water delivery contracts. This accounts for the 85,000 af of conserved water available to MWD under the 1988 IID-MWD Conservation agreement and the 1989 IID-MWD-CVWD-PVID Agreement as amended; 70,000 AF of conserved water available to SDCWA under the IID-SDCWA Transfer Agreement as amended being diverted by MWD; an estimated 29,807 AF of conserved water available to SDCWA and MWD as a result of the Coachella Canal Lining Project, 67,700 AF of water available to SDCWA and MWD as a result of the All American Canal Lining Project; 14,500 af of water IID and CVWD are forbearing to permit the Secretary of the Interior to satisfy a portion of Indian and miscellaneous present perfected rights use and 1,500 AF of water IID is conserved to create Extraordinary Conservation Intentionally Created Surplus. 78,503 AF has been subtracted for IID's Salton Sea Salinity Management. As USBR is charging uses by Yuma island pumpers to priority 2, the amount of unused water has been reduced by those uses - 6,470 af. The CRB does not concur with USBR's viewpoint on this matter.



COLORADO RIVER BOARD OF CALIFORNIA

January 28, 2011

COLORADO RIVER WATER REPORT

The following report summarizes data obtained from provisional reports of the U.S. Geological Survey, U.S. Bureau of Reclamation, International Boundary and Water Commission, and Imperial Irrigation District.

I. Active Surface Storage<sup>1/</sup> in Reservoirs at end of Month (Thousand Acre-feet).

December 2010

<u>Upper Basin</u>	<u>Storage</u>	<u>Elevation in feet</u>	<u>% of Capacity</u>	<u>Change During Month</u>	<u>Change from 2009</u>
Lake Powell	14,469	3,626.5	59%	-419	35
Flaming Gorge	3,111	6,023.7	83%	-6	-138
Fontenelle	210	6,487.3	61%	-19	12
Navajo	1,362	6,061.1	80%	-13	117
Blue Mesa	557	7,486.8	67%	2	-22
Morrow Point	112	7,154.0	96%	1	1
Crystal	16	6,748.2	87%	-0	1
Sub-total	19,837		64%	-453	6
<u>Lower Basin</u>					
Lake Mead	10,301	1,086.3	39%	365	-861
Lake Mohave	1,650	641.2	91%	84	68
Lake Havasu	582	448.1	94%	10	14
Sub-total	12,533		44%	458	-779
Upper and Lower Basin Total	32,370 <sup>2/</sup>		54%	5	-773

<sup>1/</sup> Figures shown do not include reservoir dead storage.

<sup>2/</sup> Storage above minimum operation level is  $32,370 - 15,936 = 16,434$  thousand acre-feet. Minimum operation level (15,936 thousand acre-feet) is defined as the sum of active content at minimum power pool plus minimum active content required to make surface diversions at Lake Havasu and Navajo Reservoir.

II. Upper Basin Discharge (Acre-feet).

<u>Station</u>	Meas. Flow December <u>2010</u>	<u>Cumulative Flow</u> October thru <u>December</u>	<u>Meas. Flow Adjusted for CRSP</u> <u>Surface Storage Changes</u>	
			December <u>2010</u>	% of Dec. 89- year average (1922-2010 <u>water years</u> )
Green River at Green River, Utah	178,200	496,200	172,400	145%
Colorado River near Cisco, Utah	189,800	658,100	192,400	103%
San Juan River near Bluff, Utah	50,000	161,800	37,500	75%
At Lee Ferry (Compact Point)	869,600	2,206,100	435,300	121%

III. Lower Basin Discharge (Acre-feet).

<u>Station</u>	December <u>2010</u>	<u>Cumulative Flow</u> October thru <u>December</u>
Below Hoover Dam	660,100	2,098,200
Below Davis Dam	605,400	2,126,500
Below Parker Dam	284,500	1,192,600
Above Imperial Dam	317,300	1,138,600

IV. Consumptive Use of Lower Colorado River Mainstream Water (Acre-feet).  
December, 2010

California Users	Diversion	Return	Consumptive Use	Change in	Cumulative Cons. Use		
				Cons. Use From Dec 2009	January thru December	Change from prev. Jan. thru Dec.	12 Months thru December
Palo Verde Irrig. Dist.	33,530	31,700	1,830	-960	310,060	-16,800	310,060
Yuma Proj. (Res. Div.) <sup>b/</sup>	3,460	2,410	1,050	470	38,620	1,400	38,620
Imperial Irrig. Dist. <sup>a/</sup>	119,810		119,810	6,960	2,534,320	-30,180	2,534,320
Salton Sea Mitigation	1,020		1,020	-180	79,340	49,250	79,340
USBR Operations	0		0	0	12,490	12,490	12,490
IID plus Salton Sea Mitigation	120,830		120,830	6,780	2,626,150	31,560	2,626,150
Coachella Val. Wat. Dist. <sup>a/</sup>	15,660		15,660	-1,530	301,890	-6,080	301,890
Subtotal	173,480	34,110	139,370	4,760	3,276,720	10,080	3,276,720
Fort Mojave Ind. Res. <sup>c/</sup>	840		840	0	24,760	0	24,760
Cal. Miscellaneous <sup>d/</sup>	950		950	0	34,000	0	34,000
Metropolitan Water Dist.	93,270	430	92,840	-11,070	1,096,560	-11,220	1,096,560
Total	268,540	34,540	234,000	-6,310	4,432,040	-1,140	4,432,040
<u>Arizona Users</u>							
Central Arizona Project	182,580		182,580	33,130	1,651,920	-8,090	1,651,920
Colorado River Ind. Res.	28,660	20,450	8,210	3,870	413,110	-25,870	413,110
Gila Gravity Main Canal	35,350	12,900	22,450	4,000	527,010	-23,100	527,010
Yuma Proj. (Valley Div.)	18,700	10,640	8,060	-2,080	213,040	3,600	213,040
Fort Mojave Ind. Res. <sup>c/</sup>	7,450		7,450	0	85,130	0	85,130
Havasu Nat. Wildlife Ref.	130	0	130	-130	35,490	-590	35,490
Arizona Miscellaneous <sup>d/</sup>	3,700		3,700	0	85,000	0	85,000
Total	276,570	43,990	232,580	38,790	3,010,700	-54,050	3,010,700
<u>Nevada Users</u>							
From Lake Mead <sup>b/ e/</sup>	35,040	19,270	15,770	3,510	285,220	580	285,220
Mohave Steam Plant <sup>e/</sup>	30		30	0	380	-120	380
Total	35,070	19,270	15,800	3,510	285,600	460	285,600
Total Consumptive Use (Ariz., Cal., Nev.)	580,180	97,800	481,860	35,470	7,727,820	-55,250	7,727,820

a. Based on measurements below Pilot Knob (assumed to be equal to USBR Article V data after credit is given for unmeasured California return flows between Imperial Dam and Pilot Knob). In addition, Salton Sea mitigation is not part of IID's use but is included in IID total diversion. USBR Operations consists of Salton Sea Operations 0 acre-feet and Warren H. Brock Reservoir Operations 4,040 acre-feet.

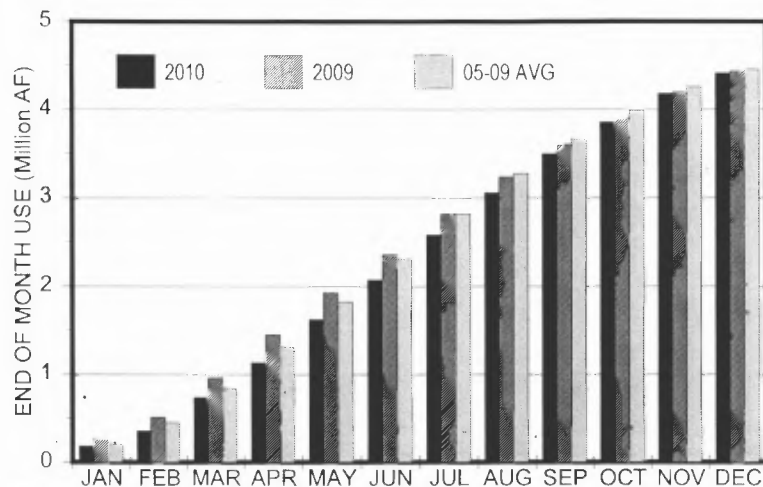
b. Return flow estimates based on averages of past returns as calculated by USBR for Article V data.

c. Dec. 2009 use from 1983 use estimated by Fort Mojave Indian Tribe. Dec. 2010 estimate from USBR for FMIR California: 589 AF diversion minus 272 AF return and 317 AF consumptive use; FMIR Arizona: 1,848 AF diversion minus 850 AF return flow and 998 AF consumptive use.

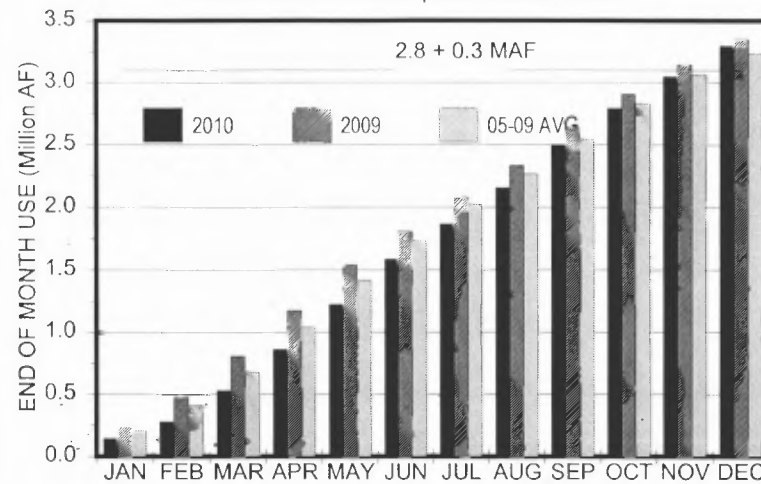
d. An estimated residual made by the Colorado River Board of California combining such items as small diversions along the river, unmeasured groundwater return flow, etc., which, when combined with other quantities listed to arrive at the State's total, presents an estimate of the State's Consumptive use of Lower Colorado River water.

e. Nevada use in December 2010 not available in USBR/LC website, the November 2010 use numbers were assumed in this months calculation and will be revised later when data are available.

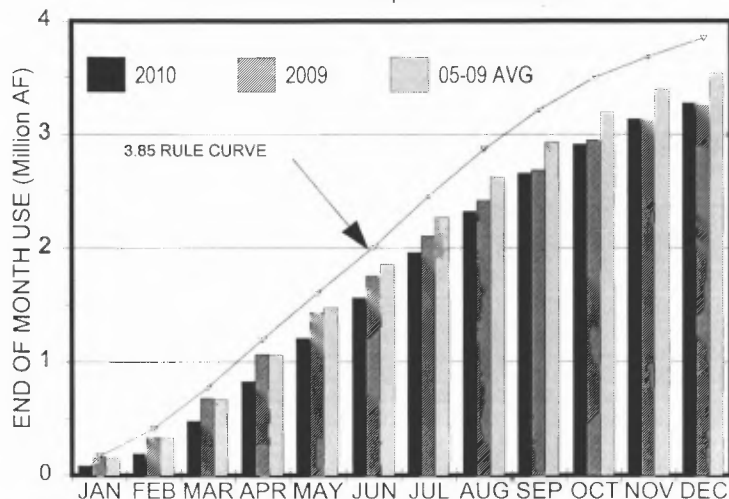
**CALIFORNIA**  
Cumulative Consumptive Water Use



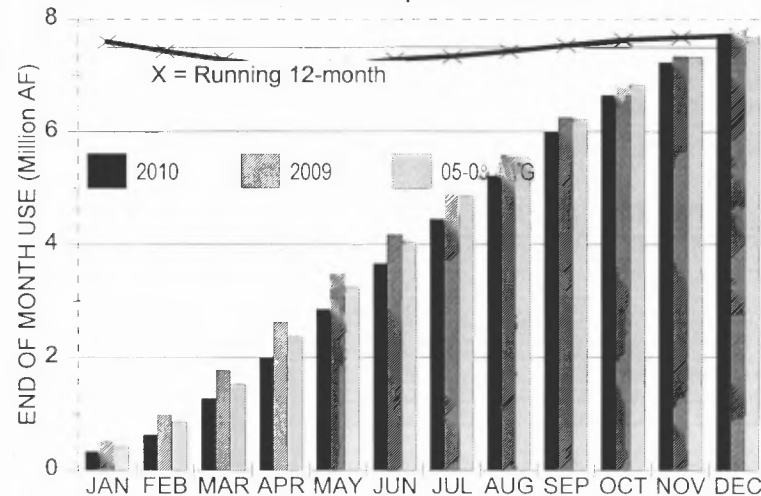
**ARIZONA + NEVADA**  
Cumulative Consumptive Water Use



**California Agricultural 3.85 Priority**  
Cumulative Consumptive Water Use



**ARIZONA + CALIFORNIA + NEVADA**  
Cumulative Consumptive Water Use



January 13, 2011, Observed Colorado River Flow into  
Lake Powell (1) (Million Acre-feet)

	<u>USBR and National Weather Service</u>		<u>Change From Last</u>	
	<u>April-July 2011</u>	<u>Water Year 2011</u>	<u>Month's Projected</u>	<u>Wat Yr 2011</u>
Maximum (2)	12.100	16.694	NA	NA
Mean	9.300 *	12.994 **	NA	NA
Minimum (2)	6.800	9.794	NA	NA

\* This month's A-J observed is 117% of the 30-year A-J average shown below.

\*\* This month's W-Y observed is 108% of the 30-year W-Y average shown below.

Comparison with past records  
of Colorado River  
inflow into Lake Powell  
(at Lee Ferry prior to 1962)

	<u>April-July Flow</u>	<u>Water Year Flow</u>
Long-Time Average (1922-2008)	7.741	11.519
30-yr. Average (1961-90)	7.735	11.724
10-yr. Average (1999-2008)	5.203	8.449
Max. of Record	15.404 (1984)	21.873 (1984)
Min. of Record	1.115 (2002)	3.058 (2002)
Year 2000	4.352	7.310
Year 2001	4.301	6.955
Year 2002	1.115	3.058
Year 2003	3.918	6.358
Year 2004	3.640	6.128
Year 2005	8.810	12.614
Year 2006	5.318	8.769
Year 2007	4.052	8.231
Year 2008	8.906	12.356
Year 2009	7.804	10.633
Year 2010	5.795	8.738
Total Years 2000 - 2004	17.326	29.809
5-Year Average (2000-2004)	3.465	5.962

(1) Under conditions of no other Upper Basin reservoirs.

(2) USBR and NWS forecasts indicate the probability of 95 percent of the time the actual flow will not exceed the maximum value, and will not be less than the minimum value.

VI. Scheduled Flows to Mexico — Arrivals and excess arrivals of Water for Calendar Year 2010  
(Acre-feet)

	(1)	(2)	(3) Excess Arrivals in accord with Minute 242	(4) Other Excess Arrivals	(5) Total Excess Arrivals	(6) Cumulative Excess Arrivals	(7) Flow Through NIB and Limitrophe	(8) Flow By-Pass Southerly International Boundary
	<u>Scheduled Flow <sup>(9)</sup></u>	<u>Total Arrivals</u>						
Jan.	121,599	185,672	11,287	52,786	64,073	64,073	166,898	11,287
Feb.	140,231	149,866	8,969	666	9,635	73,708	132,202	8,969
March	214,969	245,083	12,059	18,055	30,114	103,822	223,509	12,059
April	195,357	221,163	11,617	14,189	25,806	129,628	199,604	11,617
May	104,227	123,479	9,316	9,936	19,252	148,880	102,609	9,316
June	112,423	119,682	7,013	246	7,259	156,139	101,795	6,829
July	122,685	130,937	4,885	3,367	8,252	164,391	115,311	4,885
August	95,542	104,445	3,863	5,040	8,903	173,294	91,049	3,863
Sept.	89,308	103,077	10,342	3,427	13,769	187,063	82,074	10,342
Oct.	75,999	120,078	13,894	30,185	44,079	231,142	91,765	13,799
Nov.	109,323	126,660	12,692	4,645	17,337	248,479	101,505	12,692
Dec.	118,342	158,986	11,819	28,825	40,644	289,123	137,073	11,807
	<u>1,500,005</u>	<u>1,789,128</u>	<u>117,756</u>	<u>171,367</u>			<u>1,545,394</u>	<u>117,465</u>

- Column (1). Flow schedule requested by Mexico. In surplus years as determined by the United States, Mexico can schedule up to 1.7 rather than 1.5 million acre-feet.
- (2). Total Colorado River waters reaching Mexico. It is the sum of: 1) Colorado River water measured at the Northerly International Boundary, 2) drainage waters measured at the Southerly International Boundary near San Luis, Arizona, and 3) Wellton-Mohawk drainage waters measured at the Southerly International Boundary. It is the sum of Columns (1) + (5).
- (3). Arizona's Wellton-Mohawk Irrigation and Drainage District drainage water. This water is discharged to the Santa Clara Slough in Mexico via a concrete-lined canal.
- (4). Excess arrivals other than Wellton-Mohawk drainage. It is the sum of: 1) a delivery of about 5,000 a. f. per year to ensure that Mexico receives what is scheduled, 2) releases from Parker Dam which are not used due to unexpected rainfall in the Palo Verde, Coachella, Imperial, and Yuma areas, 3) controlled flood releases on the Gila and Colorado River, and 4) local runoff.
- (5). Sum of Columns (3) and (4).
- (6). Cumulation of Column (5).
- (7). Including Colorado River flow at the Northerly International Boundary plus flow from Cooper, 11-mile, and 21-mile spillways.
- (8). Including flow at the Southerly International Boundary, from the East and West Main canals, Yuma Valley Main, 242 Lateral plus diversions from Lake Havasu for Tijuana.
- (9). Revised schedule of Calendar Year 2010 as of July 14, 2010

WEIGHTED MONTHLY SALINITY AT  
SELECTED COLORADO RIVER STATIONS  
AND RUNNING 12-MONTH NIB-IMPERIAL FLOW-WEIGHTED SALINITY DIFFERENTIAL  
(in parts per million)

Month	Below Hoover Dam			Below Parker Dam <sup>3/</sup>			Palo Verde <sup>3/</sup> Canal Near Blythe			At Imperial Dam			At Northerly Inter- national Boundary			Running 12-Month Flow-Wtd. Differential <sup>2/</sup>	
	5-Year avg. <sup>1/</sup>			5-Year avg. <sup>1/</sup>			5-Year avg. <sup>1/</sup>			5-Year avg. <sup>1/</sup>			5-Year avg. <sup>1/</sup>				
	1974-78	2009	2010	1974-78	2009	2010 <sup>4/</sup>	1974-78	2009 <sup>4/</sup>	2010 <sup>4/</sup>	1974-78	2009	2010	1974-78	2009	2010	2009	2010
Jan.	690	665	623	709	689	630	751	720	660	913	768	756	1,041	933	831	146.4	130.7
Feb.	675	655	628	706	678	660	732	710	690	835	745	729	998	862	856	145.5	131.2
March	684	649	622	699	663	640	727	700	650	805	703	663	925	804	746	147.0	125.8
April	680	636	613	700	661	630	714	660	650	801	710	672	892	798	752	144.6	123.6
May	677	646	614	698	673	630	709	670	640	822	727	685	962	907	951	144.0	130.6
June	678	637	607	695	662	610	712	680	640	812	717	672	956	889	909	143.4	136.3
July	682	630	611	688	638	620	709	680	620	797	698	658	909	847	834	144.0	139.8
August	690	619	594	686	646	620	706	660	620	800	706	678	907	882	888	145.5	142.7
Sept.	672	603	590	686	658	620	737	670	650	815	705	676	952	865	843	143.9	144.0
Oct.	680	611	592	689	657	620	739	660	630	854	719	694	1,070	875	783	140.3	141.1
Nov.	682	626	609	692	646	640	746	680	650	897	741	692	1,010	836	816	135.3	142.9
Dec.	681	638	596	702	644	620	731	670	650	877	759	733	999	905	819	138.2	137.3

General Notes:

<sup>1/</sup> 5-Year averages are arithmetical.

<sup>2/</sup> 12-month flow-weighted differential between NIB and Imperial Dam through month shown in left column.

<sup>3/</sup> Operational values only.

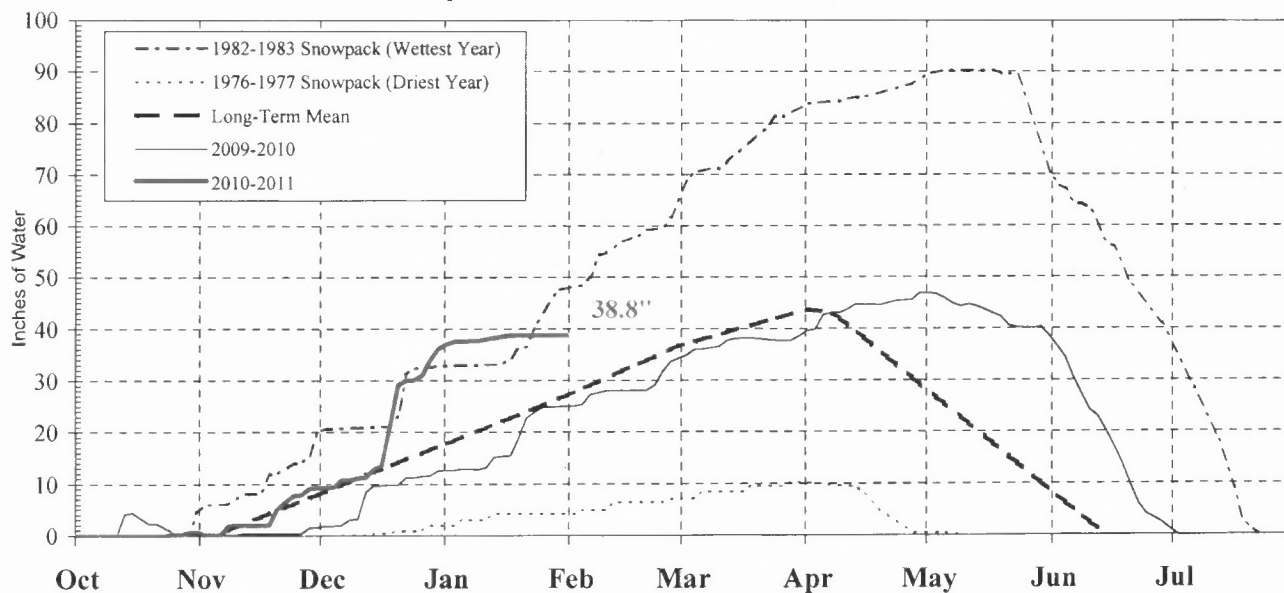
<sup>4/</sup> Values are grab samples (one or two samples per month) and are rounded to represent general magnitude of salinity at Parker Dam and Palo Verde Canal..

5.b. - State and Local Water Reports

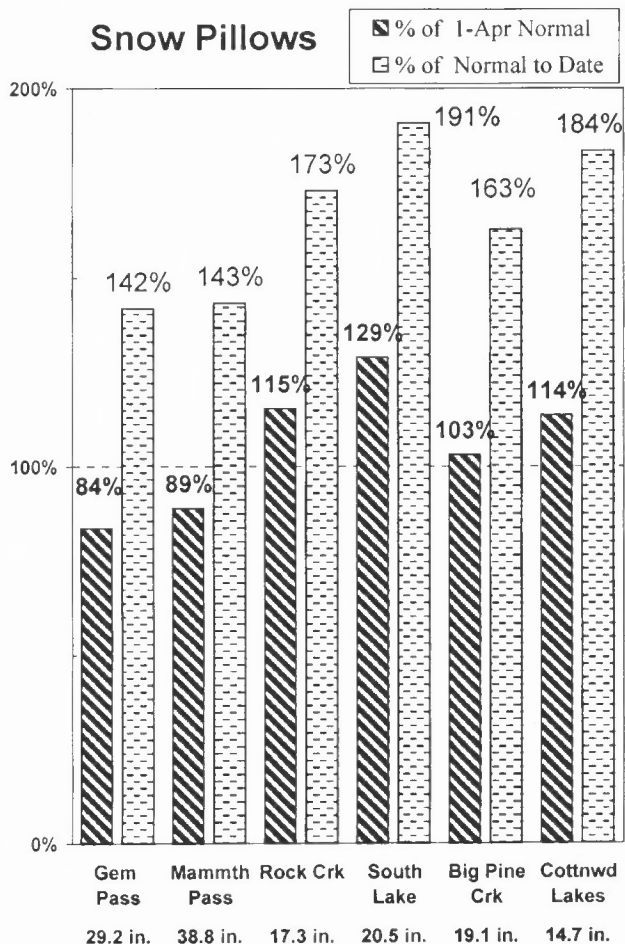


# EASTERN SIERRA CURRENT PRECIPITATION CONDITIONS As of February 1, 2011

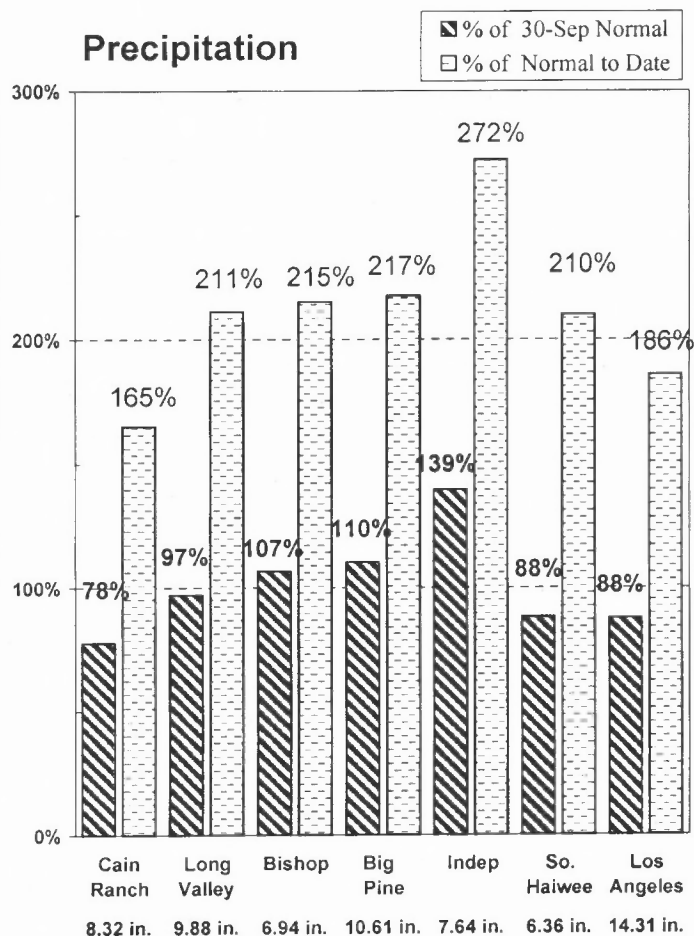
## Mammoth Pass Snowpack



## Snow Pillows



## Precipitation

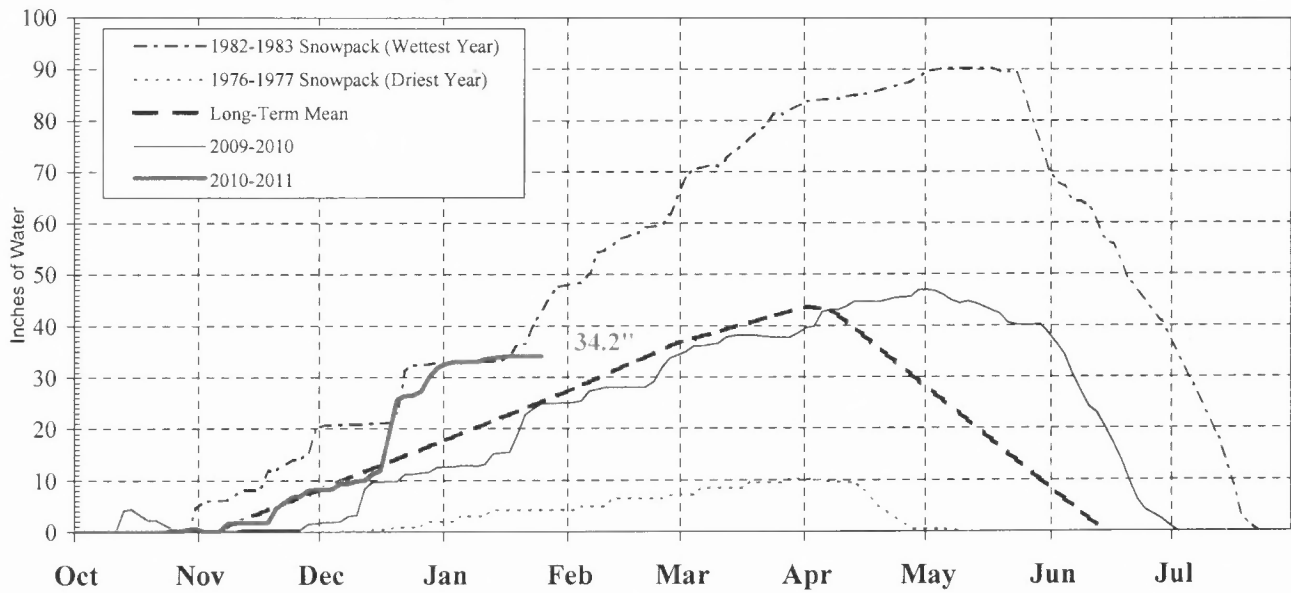


Station Location and Actual Measurement as Inches Water Content

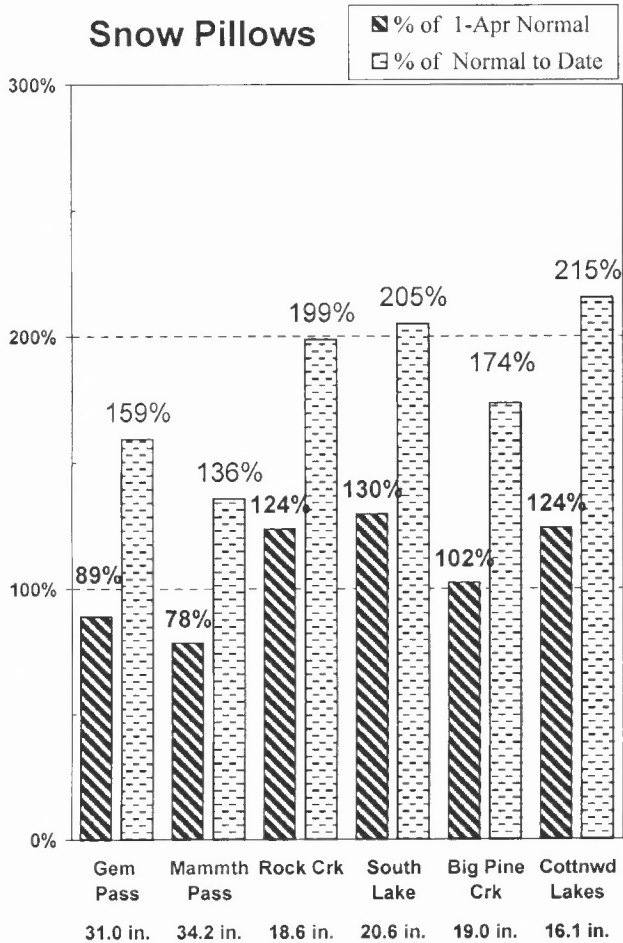
*Precipitation totals are cumulative for water year beginning Oct 1*

# EASTERN SIERRA CURRENT PRECIPITATION CONDITIONS As of January 25, 2011

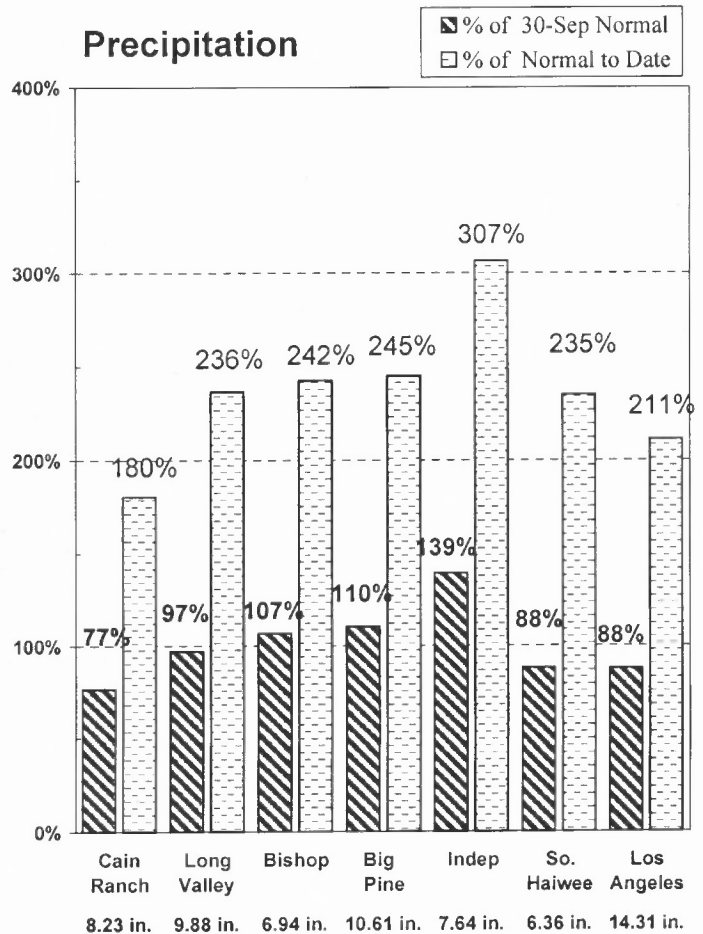
## Mammoth Pass Snowpack



## Snow Pillows



## Precipitation



Station Location and Actual Measurement as Inches Water Content

*Precipitation totals are cumulative for water year beginning Oct 1*

# EASTERN SIERRA SNOW SURVEY RESULTS

February 1, 2011

## MAMMOTH LAKES AREA

<u>Course</u>	<u>Water Content</u>	<u>Normal to Date</u>	<u>April 1 Normal</u>	<u>% of Normal to Date</u>	<u>% of April 1 Normal</u>
Mammoth Pass	38.8	27.1	43.5	143%	89%
Mammoth Lakes	20.6	13.7	21.1	151%	98%
Minarets 2	29.7	19.2	30.1	155%	99%
<b>Average:</b>	<b>29.7</b>	<b>20.0</b>	<b>31.5</b>	<b>149%</b>	<b>94%</b>

## ROCK CREEK AREA

<u>Course</u>	<u>Water Content</u>	<u>Normal to Date</u>	<u>April 1 Normal</u>	<u>% of Normal to Date</u>	<u>% of April 1 Normal</u>
Rock Creek 1	12.8	6.4	7.4	201%	173%
Rock Creek 2	15.2	7.8	10.5	194%	145%
Rock Creek 3	17.3	9.9	14.4	174%	120%
<b>Average:</b>	<b>15.1</b>	<b>8.0</b>	<b>10.8</b>	<b>188%</b>	<b>140%</b>

## COTTONWOOD AREA

<u>Course</u>	<u>Water Content</u>	<u>Normal to Date</u>	<u>April 1 Normal</u>	<u>% of Normal to Date</u>	<u>% of April 1 Normal</u>
Cottonwood Lakes 1	14.7	8.1	13.0	182%	113%
Trailhead*	15.9	9.1	13.7	175%	116%
<b>Average:</b>	<b>15.3</b>	<b>8.6</b>	<b>13.3</b>	<b>178%</b>	<b>115%</b>

## EASTERN SIERRA OVERALL SNOW PACK

<u>Average of all Snow Courses</u>	<u>Water Content</u>	<u>Normal to Date</u>	<u>April 1 Normal</u>	<u>% of Normal to Date</u>	<u>% of April 1 Normal</u>
	20.0	12.2	18.6	164%	108%

Normals are based on the 1956-2005 period.

\* Trailhead has only been measured since 1982, so the normal is estimated.

PSS 2/1/2011

5.c. - Colorado River Operations

October 2010

# ENERGY-WATER NEXUS

A Better and  
Coordinated  
Understanding of  
Water Resources  
Could Help Mitigate  
the Impacts of  
Potential Oil Shale  
Development



G A O

Accountability \* Integrity \* Reliability

## ENERGY-WATER NEXUS

### A Better and Coordinated Understanding of Water Resources Could Help Mitigate the Impacts of Potential Oil Shale Development

#### Why GAO Did This Study

Oil shale deposits in Colorado, Utah, and Wyoming are estimated to contain up to 3 trillion barrels of oil—or an amount equal to the world's proven oil reserves. About 72 percent of this oil shale is located beneath federal lands, making the federal government a key player in its potential development. Extracting this oil is expected to require substantial amounts of water and could impact groundwater and surface water. GAO was asked to report on (1) what is known about the potential impacts of oil shale development on surface water and groundwater, (2) what is known about the amount of water that may be needed for commercial oil shale development, (3) the extent to which water will likely be available for commercial oil shale development and its source, and (4) federal research efforts to address impacts to water resources from commercial oil shale development. GAO examined environmental impacts and water needs studies and talked to Department of Energy (DOE), Department of the Interior (Interior), and industry officials.

#### What GAO Recommends

GAO recommends that Interior establish comprehensive baseline conditions for water resources in oil shale regions of Colorado and Utah, model regional groundwater movement, and coordinate on water-related research with DOE and state agencies involved in water regulation. Interior generally concurred with GAO's recommendations.

#### What GAO Found

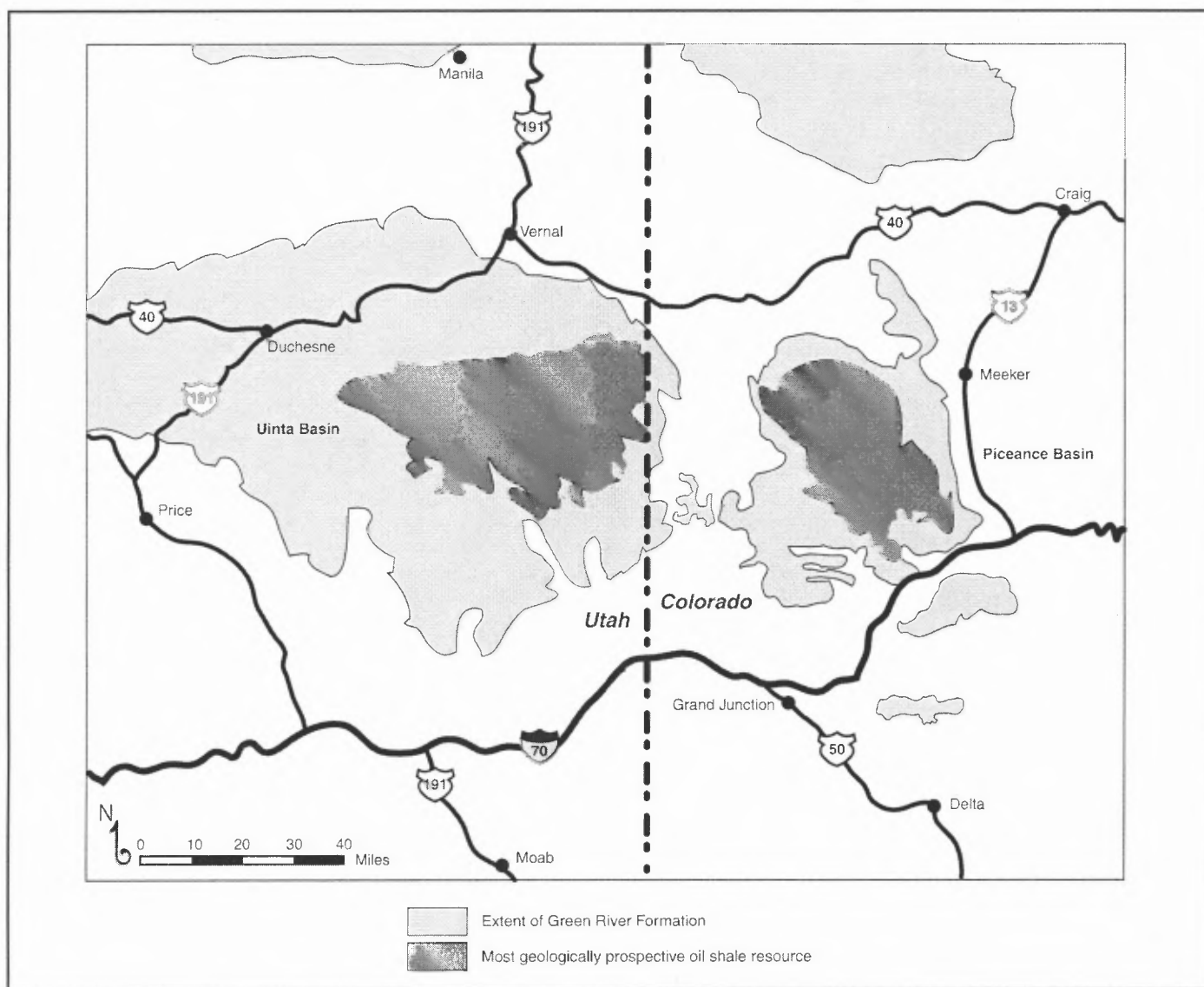
Oil shale development could have significant impacts on the quality and quantity of water resources, but the magnitude of these impacts is unknown because technologies are years from being commercially proven, the size of a future oil shale industry is uncertain, and knowledge of current water conditions and groundwater flow is limited. In the absence of effective mitigation measures, water resources could be impacted from ground disturbances caused by the construction of roads and production facilities; withdrawing water from streams and aquifers for oil shale operations, underground mining and extraction; and discharging waters produced from or used in operations.

Estimates vary widely for the amount of water needed to commercially produce oil shale primarily because of the unproven nature of some technologies and because the various ways of generating power for operations use differing quantities of water. GAO's review of available studies indicated that the expected total water needs for the entire life cycle of oil shale production ranges from about 1 barrel (or 42 gallons) to 12 barrels of water per barrel of oil produced from in-situ (underground heating) operations, with an average of about 5 barrels, and from about 2 to 4 barrels of water per barrel of oil produced from mining operations with surface heating.

Water is likely to be available for the initial development of an oil shale industry, but the size of an industry in Colorado or Utah may eventually be limited by water availability. Water limitations may arise from increases in water demand from municipal and industrial users, the potential of reduced water supplies from a warming climate, fulfilling obligations under interstate water compacts, and the need to provide additional water to protect threatened and endangered fishes.

The federal government sponsors research on the impacts of oil shale on water resources through DOE and Interior. DOE manages 13 projects whose water-related costs total about \$4.3 million, and Interior sponsored two water-related projects, totaling about \$500,000. Despite this research, nearly all of the officials and experts that GAO contacted said that there are insufficient data to understand baseline conditions of water resources in the oil shale regions of Colorado and Utah and that additional research is needed to understand the movement of groundwater and its interaction with surface water. Federal agency officials also said they seldom coordinate water-related oil shale research among themselves or with state agencies that regulate water. Most officials noted that agencies could benefit from such coordination.

**Figure 1: Location of Oil Shale Resources in Colorado and Utah**



Source: Adopted from BLM.

Stakeholders in the future development of oil shale are numerous and include the federal government, state government agencies, the oil shale industry, academic institutions, environmental groups, and private citizens. Among federal agencies, BLM manages the land and the oil shale beneath it and develops regulations for its development. USGS describes

# Climate Impacts on Extreme Events

a workshop sponsored by the

WESTERN GOVERNORS' ASSOCIATION / WESTERN STATES WATER COUNCIL  
and  
CALIFORNIA DEPARTMENT OF WATER RESOURCES

Doubletree San Diego Downtown  
1646 Front Street

San Diego, California  
March 21-23, 2011

The Western Governors' Association, the Western States Water Council, and the California Department of Water Resources are cosponsoring a workshop on the possible impacts of climate on extreme events/severe weather on March 21-23 in San Diego, California. It will begin Monday, March 21 at 1:00 pm and conclude Wednesday, March 23 by 12 noon. A block of rooms has been reserved at the Doubletree San Diego Downtown and will be held through March 1, 2011. Please contact the reservations department directly at (619) 239-6800, or 1-800-222-TREE and identify yourself as attending the Western States Water Council meetings. **Reservations must be made by the March 1 deadline to obtain the rate of \$110 single/double occupancy.**

The purpose of the workshop is to discuss developing methodologies for addressing climate non-stationarity related to increased severity or frequency of extreme and/or severe weather events, such as floods and droughts. State and local water and public works agencies are seeking defensible standards of practice that can be incorporated as part of climate adaptation efforts. State water management agencies and others under the auspices of the Western States Water Council are uniquely positioned to advise western governors as part of implementing their June 2006 report, "Water Needs and Strategies for a Sustainable Future," and the June 2008 "Next Steps" report. The latter suggests states should "assess historical, current and projected climate trends and relate these to potential changes...to prepare for and mitigate the impacts from climate change and variability."

**Pre-Registration Fee** (By Mar 1, 2011): **\$150.** Check, money order, or purchase order should accompany this form.  
**Registration Fee** (after March 1, 2011): **\$200.**

## Registration

NAME

(as you would like it to appear on name badge)

TITLE

AGENCY

ADDRESS

CITY

STATE

ZIP

EMAIL

PHONE

FAX

Fax to: (801) 685-2559 OR Email to: [jgroat@wswc.utah.gov](mailto:jgroat@wswc.utah.gov) OR

Mail to: Western States Water Council, 5296 S Commerce Drive, Suite 202, Murray, UT 84107-5340



5.e. - Colorado River Environmental Issues

# RECLAMATION

## *Managing Water in the West*

The Department of the Interior, acting through the Bureau of Reclamation, is proposing to develop and implement a protocol for high-flow experimental releases from Glen Canyon Dam to better determine whether and how sand conservation can be improved in the Colorado River corridor downstream from Glen Canyon Dam. A draft environmental assessment (EA) has been prepared to analyze and disclose the environmental effects of the proposed action. The EA is available on our website at [www.usbr.gov/uc](http://www.usbr.gov/uc) under the "Environmental Documents" link. A printed copy of the report is available for review at the Bureau of Reclamation, Upper Colorado Regional Office, 125 South State Street, Room 7218, Salt Lake City, Utah 84138.

Under the protocol of high flow experimental releases, sand from tributaries that is stored in the river channel is suspended by high-volume dam releases and a portion of the sand is redeposited in downstream reaches as sandbars and beaches, while another portion is transported downstream by river flows. These sand features and associated nearshore habitats are important components of the Colorado River ecosystem and provide camping opportunities for river runners and hikers along the Colorado River.

The public is invited to comment on the draft EA. Comments may be provided to Reclamation until February 14, 2011. For additional information, to request a CD-ROM or printed copy of the EA, or to be removed from our mailing list, please contact Dennis Kubly at 801-524-3715 or by e-mail at [protocol@usbr.gov](mailto:protocol@usbr.gov). Comments should be sent to this e-mail address or via regular mail to the address provided above.

# RECLAMATION

*Managing Water in the West*

## Draft Environmental Assessment

Development and Implementation of a Protocol for  
High-Flow Experimental Releases from Glen  
Canyon Dam, Arizona, 2011 through 2020



U.S. Department of the Interior  
Bureau of Reclamation  
Upper Colorado Region  
Salt Lake City, Utah

1/14/2011

## **Mission Statements**

The U.S. Department of the Interior protects and manages the nation's natural resources and cultural heritage; provides scientific and other information about those resources; and honors its trust responsibilities or special commitments to American Indians, Alaska natives, and affiliated island communities.

The mission of the Bureau of Reclamation is to manage, develop, and protect water and related resources in an environmentally and economically sound manner in the interest of the American Public.

## **Development and Implementation of a Protocol for High-Flow Experimental Releases from Glen Canyon Dam, Arizona, 2011 through 2020**

Proposed agency action: Development and implementation of a protocol for high-flow experimental releases from Glen Canyon Dam, Arizona, 2011 through 2020

Type of statement: Environmental Assessment

Lead agency: Bureau of Reclamation, Upper Colorado Region

Cooperating agencies: Federal:  
National Park Service, Intermountain Region  
Bureau of Indian Affairs  
U.S. Fish and Wildlife Service  
U.S. Geological Survey, Pacific Southwest Area  
Western Area Power Administration  
State:  
Arizona Game and Fish Commission  
Upper Colorado River Commission  
American Indian Tribes:  
Hualapai Tribe  
Pueblo of Zuni  
Hopi Tribe

For further information: Larry Walkoviak, Regional Director  
Attention: Dennis Kubly  
Bureau of Reclamation, Upper Colorado Region  
125 South State Street, Room 6103  
Salt Lake City, UT 84138  
(801) 524-3715  
protocol@usbr.gov

Date of distribution: January 14, 2011

- **Recreation.**—All river-based recreation activities would be affected to some degree by the high-flow release, although little or no impact outside of the flow period is expected. There is some risk of longer-term adverse impacts on trout fishing, especially if high-flow releases are conducted frequently. A warning system would need to be developed to advise anglers, boaters, and rafters of a planned HFE. The Hualapai Tribe has informed Reclamation of potential adverse effects to its commercial operations on the Colorado River. Appropriate monitoring and mitigation measures will be determined as part of the ongoing tribal consultation process.

## **Executive Summary**

---

The Department of the Interior (Interior), acting through the Bureau of Reclamation (Reclamation), is proposing to develop and implement a protocol for high-flow experimental releases (HFEs) from Glen Canyon Dam to better determine whether and how sand conservation can be improved in the Colorado River corridor within Grand Canyon National Park. This protocol will evaluate short-duration, high-volume dam releases during sediment-enriched conditions for a 10-year period, 2011–2020, to determine how multiple events can be used to better conserve sand over a long time period. Under the concept of HFEs, sand stored in the river channel is suspended by these dam releases and a portion of the sand is redeposited downstream as sandbars and beaches, while another portion is transported downstream by river flows. These sand features and associated backwater habitats can provide key wildlife habitat, protect archaeological sites, enhance riparian vegetation, and provide camping opportunities along the Colorado River in Grand Canyon National Park. Additional attention would be given to ensure that other resources would not be unduly or unacceptably impacted or that any such impacts could be sufficiently mitigated.

The purposes of this action are: (1) to develop and implement a protocol that determines when and under what conditions to conduct experimental high volume releases, and (2) to evaluate the parameters of high-flow releases in conserving sediment to benefit downstream resources in Glen, Marble, and Grand Canyons.

This action is needed to take advantage of future sediment-enriched conditions in the Colorado River with experimental high flow tests that will improve the understanding of the relationships between high dam releases of up to 45,000 cfs and sediment conservation. The information developed through this action will assist Interior in making future decisions on when and how to conduct multi-year, multi-event high flow experimental releases and how to evaluate benefits to downstream resources.

This protocol for high-flow experimental releases is part of the ongoing implementation of the Glen Canyon Dam Adaptive Management Program (GCDAMP), and is a component of Interior's compliance with the Grand Canyon Protection Act of 1992 (Public Law 102-575, GCPA). Annual release volumes would follow the 2007 Colorado River Interim Guidelines for Lower Basin Shortages and Coordinated Operations for Lake Powell and Lake Mead; in addition, releases would also follow the Modified Low Fluctuating Flow (MLFF) preferred alternative as described in the 1996 Record of Decision for the Operation of Glen Canyon Dam, with the added refinement of steady flows as identified in the 2008 Biological Opinion and the 2009 Supplemental Biological Opinion. The timing of

high-flow releases would be March-April and October-November, and the magnitude may range from 31,500 cfs to 45,000 cfs, and the duration may range from one hour to 96 hours.

The proposed HFE protocol is a decision-making process that consists of three components: (1) planning and budgeting, (2) modeling, and (3) decision and implementation. First, planning will occur such that an HFE can be conducted if conditions are appropriate. An important aspect of planning is the development and implementation of research and monitoring activities appropriate to monitor the effects of the HFEs and as described in a Science Plan. Second, a hydrology model and sand budget model will be used to evaluate the available volume of water for release from the dam and the sand availability, as delivered primarily by the Paria River, at the onset of each release window. Finally, the decision to conduct an HFE would be based on a determination by scientists and federal managers of the suitability of the hydrology, sediment, and other resource conditions, and a recommendation to Interior.

Impacts of the proposed action were identified and evaluated in comparison to an environmental baseline for four resource categories, including physical, biological, cultural, and socio-economic. The predicted impacts of the high-flow experimental release protocol on these resources are summarized as follows:

- **Water Resources.**—The pattern of monthly releases from Glen Canyon Dam would differ slightly from no action, depending on the frequency of high-flow releases, but annual releases would comply with interim guidelines and reservoir operations.
- **Water Quality.**—HFEs are expected to have minor short-term impacts on water quality of Lake Powell and the Colorado River below Glen Canyon Dam. Dam releases will cause a slight reduction in downstream temperature and a slight increase in salinity, as well as temporary turbidity increase from scouring. Because effects of an HFE on water quality are short-lived, impacts to water quality from multiple HFEs are not expected to be greater than single HFEs. The impact of HFEs on the water quality of Lake Powell will depend on reservoir elevation, but are not expected to affect the long-term water quality of the reservoir.
- **Air Quality.**—Energy generated from coal or gas-fired powerplants will need to make up the amount of hydropower lost from releasing water through the bypass tubes. Two HFEs within the same year would result in an amount of CO<sub>2</sub> emissions from these alternative sources estimated to be about 0.05 percent of regional emissions. The long-term impact depends on the number of consecutive HFEs and the total number over the 10-year period, but the long-term impact is not expected to be substantial since the effects to air quality would be expected to dissipate quickly between HFEs.
- **Sediment.**—Single HFEs are expected to suspend and redeposit sediment on sandbars and beaches up to the magnitude of the HFE, but that material is expected to erode with ensuing flows. Two consecutive HFEs are expected to have a

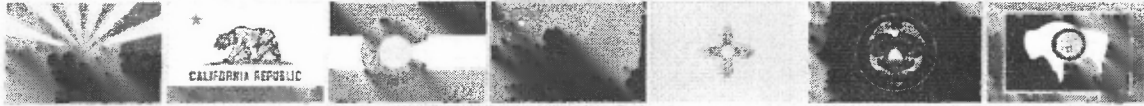


beneficial impact from the additional sediment stored in sandbars and beaches that may better balance the sediment budget. Effects of more than two consecutive HFEs are uncertain, but they may have a long-term beneficial impact from the additional sediment stored in sandbars, beaches, and eddies up to 45,000 cfs stage. Multiple successive HFEs would have the potential for better balancing sediment delivery between upstream and downstream reaches and for long-term conservation of sediment to offset ongoing transport and erosion; however, successive HFEs or intervening periods of degradation without HFEs could offset this positive effect if they negatively impact the sand mass balance. Furthermore, this degradation, if extreme, could impact other resources and it is advisable to ensure that the net amount of sand in the river channel is not overly depleted so as to compromise other ecosystem components.

- **Vegetation.**—Some riparian vegetation would be lost through scouring or burial by sediment transported during a high-flow release. Both emergent marsh and woody vegetation would recover quickly in the months and years, respectively, following the release and return to no action conditions. If high-flow releases are held frequently, recovery of plants may be slower.
- **Terrestrial Invertebrates and Herpetofauna.**—Some habitat and individual animals will likely be scoured and exported, but these are expected to recover quickly with no population level impacts. Frequent HFEs would likely cause animals to relocate further upslope.
- **Kanab Ambersnail.**—The endangered Kanab ambersnail would likely sustain short-term population and habitat impacts at Vasey's Paradise, although the allowable incidental take would not be exceeded.
- **Aquatic Foodbase.**—The proposed action would likely result in a temporary reduction in the aquatic foodbase, most notably *Cladophora*, associated diatoms, and *Gammarus*, in the Glen Canyon reach, with increased drift downstream. Spring releases would likely stimulate production with short-term recovery of less than 4 months. Fall releases would also scour the foodbase, but recovery could take longer because of the low photosynthesis that would occur in winter following the HFE. Research will need to be gathered on the impacts of seasonal short-term high flows on the aquatic foodbase. Multiple, consecutive HFEs could reduce forms susceptible to high flows and favor flood-resistant forms, possibly resulting in reduced species diversity.
- **Humpback Chub.**—Adult humpback chub are not likely to be impacted by HFEs. Young-of-year and juveniles could be displaced by high flows from nursery habitats near the Little Colorado River into less desirable downstream habitat. These young fish may also experience higher rates of predation and competition from increased numbers of trout as an unintended consequence of the HFEs. These impacts are not expected to affect the overall population of humpback chub in Grand Canyon. Periodic HFEs are likely to benefit the humpback chub by

reshaping and maintaining habitats, stimulating foodbase production, and reducing numbers of flood-susceptible non-native fish.

- **Razorback Sucker.**—Razorback suckers have been found spawning in the Colorado River inflow within 10 miles of Pearce Ferry, with a total of 40 larvae caught between Pearce Ferry and Iceberg Canyon in 2000, 2001, and 2010. HFEs could displace larvae in spring, but could also create new productive nursery habitats and deliver large amounts of food for all sizes of fish. The proposed action is not expected to have population-level impacts to the razorback sucker.
- **Non-native Fish.**—Non-native fish life cycles would be temporarily disrupted. Backwaters would be reformed and subsequently available for use by native and non-native fish after the high-flow. Research data would be obtained on the relationships between flow duration and magnitude and backwater formation.
- **Trout.**—Based on information learned during prior high flow releases, high-releases in spring (March-April) would likely increase survival and recruitment of rainbow trout in the Lees Ferry reach because of the cleansing effect of spawning/incubating gravels and stimulated food production. Increased density of trout could result in dispersal of young trout to downstream areas where these fish could prey on and compete with the endangered humpback chub. It is likely that some trout eggs, fry, and young would be destroyed or lost downstream. This temporary loss could reduce total trout numbers and help to stabilize the size and age structure of the population. There is some risk that the aquatic foodbase would be reduced, subsequently affecting adult trout for a period following a high-flow release. The impact of a fall HFE on the trout population is uncertain.
- **Birds.**—The proposed action is not likely to adversely impact any bird species, including the endangered southwestern willow flycatcher and the California condor.
- **Mammals.**—Wildlife use riparian vegetation as habitat, and some habitat would be temporarily lost during a high-flow release. Patches of bare sand created by the release would add diversity to the new high water zone habitats. Habitat conditions would return to no action levels as riparian vegetation returns to no action conditions.
- **Cultural Resources.**—Reclamation has determined that historic properties would be adversely affected per 36 CFR 800.6; consultation with SHPOs and THPOs is in progress. Access to sacred sites would be temporarily restricted during high flows and this constitutes an adverse effect.
- **Hydropower.**—No change to operating criteria for Glen Canyon Dam or interim guidelines for reservoir operations would occur except during the high-flow release. The estimated difference in lost revenue and replacement power cost from no action over a 10-year period in 2010 dollars is \$5.99-\$12.51 million.



**Governor's Representatives on Colorado River Operations  
States of Arizona, California, Colorado, Nevada, New Mexico, Utah and  
Wyoming**

February 1, 2011

*Via E-Mail and U.S. Mail*

Mr. Larry Walkoviak, Regional Director  
Attn: Mr. Dennis Kubly  
Bureau of Reclamation  
Upper Colorado Regional Office  
125 South State Street, Room 7218  
Salt Lake City, Utah 84138

Re: Request for Extension of Public Comment Period—Draft Environmental Assessment: Development and Implementation of a Protocol for High-Flow Experimental Releases from Glen Canyon Dam, Arizona, 2011 through 2020

Dear Mr. Kubly,

We write to request an extension of time to submit comments on the above Bureau of Reclamation (BOR) Draft Environmental Assessment (DEA). The current deadline to submit comments is February 14, 2011. As detailed below, we request an extension in order to review and comment on the documents which are lengthy, include complex hydrologic modeling analyses, and recommend additional monitoring at significant additional cost to the Adaptive Management Program.

The States are also concerned that they do not have access to other important information and analyses. It is a fundamental component of NEPA's procedural requirements that BOR must make available for public review during the comment period all of the data, documents, and information that is referenced in the DEA and used to support the conclusions made in the DEA. There are documents, studies, and information relied upon and cited in the DEA that have not yet been released or made available for public review.

The States request that the public comment period be extended for the reasons stated above. Given the current comment period deadline of February 14, 2011, it would be most helpful to know if the BOR will be providing an extension of the public comment period, and if so for how long, by February 4, 2011.

Mr. Dennis Kubly  
February 1, 2011  
Page 2 of 3

Thank you for your and BOR's consideration of this request and please let us know if you have any questions.

Sincerely,



Sandra A. Fabritz-Whitney  
Acting Director  
Arizona Department of Water  
Resources



Dana B. Fisher, Jr.  
Chairman  
Colorado River Board of California



Jennifer Gimbel  
Director  
Colorado Water Conservation Board



Patricia Mulroy  
General Manager  
Southern Nevada Water Authority



George Caan  
Executive Director  
Colorado River Commission of Nevada



John R. D'Antonio, Jr.  
Secretary  
New Mexico Interstate Stream  
Commission



Dennis Strong, Director  
Utah Division of Water Resources  
Utah Interstate Stream Commissioner



Patrick Tyrell  
State Engineer  
State of Wyoming

Mr. Dennis Kubly  
February 1, 2011  
Page 3 of 3

cc: Anne Castle, Assistant Secretary, Water and Science, U.S. Department  
of Interior  
Michael L. Connor, Commissioner, U.S. Bureau of Reclamation  
Larry Walkoviak  
Lorri Gray-Lee

6.a. - Groundwater Cleanup at the PG&E Topock Gas Compression Station Site

**COLORADO RIVER BOARD OF CALIFORNIA**

770 FAIRMONT AVENUE, SUITE 100

GLENDALE, CA 91203-1035

(818) 500-1625

(818) 543-4685 FAX



January 27, 2011

Ms. Karen Baker  
Chief, Geology Permitting and Correction Action Branch  
Department of Toxic and Substances Control  
5796 Corporate Avenue  
Cypress, CA 90630

**Topock Groundwater Remediation - Final Environmental Impact Report**

Dear Ms. Baker:

The Colorado River Board of California (CRB) would like to acknowledge the role and efforts of the Department of Toxic and Substances Control (DTSC) associated with groundwater remediation project at the Pacific Gas and Electric (PG&E) Topock site. The CRB currently supports the analysis that has identified the selection of Alternative E (In-situ Treatment with Fresh Water Flushing) as the preferred alternative for addressing the hexavalent chromium contamination of the local aquifer at the PG&E Topock pumping station site adjacent to the Colorado River. The CRB has no additional comments to provide on the Final Environmental Impact Report at this time.

The CRB continues to look forward to working with DTSC in the implementation of an effective groundwater remediation solution at the project site. If you have any questions please feel free to contact Mr. Abbas Amirteymoori at (818) 500-1625.

Sincerely,

A handwritten signature in cursive script, appearing to read 'CS Harris'.

Christopher S. Harris  
Acting Executive Director

cc: Mr. Bart Koch, Environmental Health and Safety Section manager  
The Metropolitan Water District of Southern California



Linda S. Adams  
Acting Secretary for  
Environmental Protection



## Department of Toxic Substances Control

---

Maziar Movassaghi  
Acting Director  
1001 "I" Street  
P.O. Box 806  
Sacramento, California 95812-0806



Edmund G. Brown Jr.  
Governor

January 17, 2011

Gerald R. Zimmerman  
Acting Executive Director  
Colorado River Board of California  
770 Fairmont Avenue, Suite 100  
Glendale, CA 91203-1068

PACIFIC GAS AND ELECTRIC TOPOCK COMPRESSOR STATION, Groundwater  
Remediation Project Final Environmental Impact Report, SCH # 2008051003

Dear Mr. Zimmerman:

The California Department of Toxic Substances Control (DTSC) is providing your agency a copy of the Final Environmental Impact Report (FEIR) for the PG&E Topock Compressor Station Groundwater Remediation Project for a 10 day review period (January 18 – 27, 2011). This review opportunity is being provided pursuant to California Public Resources Code, Division 13, Chapter 2.6, § 21092.5(a), and California Code of Regulations, Title 14, § 15088(b).

The enclosed FEIR contains 2 Volumes: Volume 1 consists of an overview of the proposed remediation project, comments received by DTSC from all participating stakeholders during the 45 day comment period on the draft EIR (DEIR), and DTSC's responses to those comments. Volume 2 is the revised DEIR which contains the corrections and clarifications made in response to comments received from a multitude of participating stakeholders.

Please contact Mr. Aaron Yue at (714) 484-5439 or at [ayue@dtsc.ca.gov](mailto:ayue@dtsc.ca.gov) if you have any questions regarding this matter.

Sincerely,



Karen Baker, Performance Manager  
Office of Geology



Mr. Zimmerman  
January 17, 2011  
Page 2 of 2

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# Groundwater Record of Decision

Pacific Gas and Electric Company  
Topock Compressor Station, Needles, San  
Bernardino County, California

December 2010

**U.S. Department of the Interior**

**Office of Environmental Policy and Compliance**

## Groundwater Record of Decision

### Table of Contents

Part 1: Declaration .....	1
A. Site Name and Location .....	2
B. Statement of Basis and Purpose .....	2
C. Assessment of Site .....	2
D. Description of Selected Remedy .....	3
E. Statutory Determinations .....	3
G. Data Certification Checklist .....	4
H. Authorizing Signatures .....	4
Part 2: Decision Summary .....	5
A. Site Name, Location, and Description .....	6
B. Site History and Enforcement Activities .....	6
C. Community Participation .....	9
D. Scope and Role of Response Action .....	12
E. Site Characteristics .....	14
F. Current and Potential Future Land and Water Uses .....	21
G. Summary of Site Risks .....	22
H. Remedial Action Objectives .....	24
I. Description of Alternatives .....	24
J. Comparative Analysis of Alternatives .....	29
K. Principal Threat .....	34
L. Selected Remedy .....	35
M. Statutory Determinations .....	38
Figures and Tables .....	42
Part 3: Responsiveness Summary .....	59

**Groundwater Record of Decision**  
**SWMU 1/AOC 1 and AOC 10**  
**PG&E Topock Compressor Station**  
**Needles, San Bernardino County, California**

**Part 1: Declaration**

**United States Department of the Interior**

## **PART 1: THE DECLARATION**

### ***A. Site Name and Location***

Site Name: Pacific Gas and Electric Company (PG&E) Topock Compressor Station,

CERCLIS Identification Number: CAT080011729

Location: San Bernardino County, California (*See Part 2 – Figure 1*)

### ***B. Statement of Basis and Purpose***

This decision document (“Record of Decision” or “ROD”) presents the Remedial Action (“Selected Remedy”) addressing groundwater contamination resulting from past disposal practices at the PG&E Topock Compressor Station in San Bernardino County, California. The Selected Remedy was chosen in accordance with the Comprehensive Environmental Response, Compensation and Liability Act (“CERCLA”), as amended, and the National Oil and Hazardous Substances Pollution Contingency Plan (“NCP”). The Selected Remedy was chosen by the United States Department of the Interior (“DOI”) on behalf of the U.S. Fish and Wildlife Service (“USFWS”), the Bureau of Land Management (“BLM”), and the Bureau of Reclamation (“Reclamation”) (collectively the “Federal Agencies”) pursuant to the Federal Agencies’ CERCLA lead agency authorities. This decision is based on the Administrative Record file for this site.

The State of California Environmental Protection Agency, Department of Toxic Substances Control (“DTSC”), concurs with the Selected Remedy. DTSC reviewed all site-related documents and identified its preferred alternative in DTSC’s draft Statement of Basis. DOI and DTSC have coordinated fully in the selection of a final remedial action and the State concurs with the Selected Remedy.

### ***C. Assessment of Site***

The Selected Remedy presented in this ROD is necessary to protect the public health or welfare or the environment from actual or threatened releases of hazardous substances into the environment. Specifically, concentrations of total chromium (“Cr (T)”) in groundwater are greater than federal and California regulatory standards and concentrations of hexavalent chromium (“Cr (VI)”) in groundwater exceed background levels. The groundwater risk assessment has concluded that Cr (VI) is present in groundwater at concentrations that pose an unacceptable risk to human health if the groundwater were to be used as a drinking water source.

#### ***D. Description of Selected Remedy***

The Selected Remedy was identified as “Alternative E – In Situ Treatment with Fresh Water Flushing” in the Corrective Measures Study/Feasibility Study (“CMS/FS”) conducted for the site (*See Part 2 – Figure 2*). The Selected Remedy includes:

- Construction of an In-Situ Reactive Zone (“IRZ”) along National Trails Highway using a line of wells that may be used as both injection and extraction wells to circulate groundwater and distribute an organic carbon source to promote bacteriological reduction of the Cr (VI) to trivalent chromium (“Cr (III)”).
- Flushing accomplished through a combination of potable water injection and injection of carbon amended water in wells upgradient of the plume.
- Extraction wells near the Colorado River to provide hydraulic capture of the plume, accelerate cleanup of the floodplain, and enhance the flow of contaminated groundwater through the IRZ line.
- Bedrock extraction wells in the eastern (downgradient) end of the East Ravine to provide hydraulic capture of contaminated groundwater in bedrock. Extracted water will be treated and managed using the same active treatment system that will be used to treat and manage contaminated groundwater extracted from the Alluvial Aquifer.
- Institutional controls to restrict surface land uses and prevent the use of groundwater.
- Monitored natural attenuation as a *long term* component to address residual Cr (VI) that may remain in recalcitrant portions of the aquifer after *in-situ* treatment.

A more detailed description of the Selected Remedy is presented in Section L of the Decision Summary of this ROD.

#### ***E. Statutory Determinations***

The Selected Remedy is protective of human health and the environment, complies with Federal and State requirements that are applicable or relevant and appropriate to the remedial action, is cost-effective, and utilizes permanent solutions and alternative treatment technologies to the maximum extent practicable.

The Selected Remedy also satisfies the statutory preference for treatment as a principal element of the remedy.

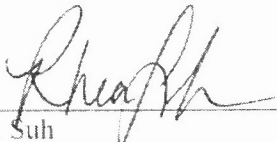
Because the Selected Remedy will result in hazardous substances, pollutants, or contaminants remaining on-site above levels that allow for unrestricted use, a statutory review will be conducted within five years after initiation of remedial action, and every five years thereafter until cleanup standards are achieved to ensure that the remedy is, or will be, protective of human health and the environment.

### ***G. Data Certification Checklist***

The following information is included in the Record of Decision:

1. Chemicals of concern (“COCs”) and their respective concentrations.....Section G
2. Baseline risk represented by the COCs.....Section G
3. Cleanup levels established for COCs and the basis for these levels.....Section H
4. How source materials constituting principal threats will be addressed....Section D
5. Current and reasonably anticipated future land use assumptions and current and potential future beneficial uses of groundwater used in the baseline risk assessment and ROD.....Section F
6. Potential land and groundwater use that will be available at the site as a result of the Selected Remedy.....Section F
7. Estimated capital, annual operation and maintenance (O&M), and total present worth costs, discount rate, and the number of years over which the remedy cost estimates are projected.....Section L
8. Key factor(s) that led to selecting the remedy.....Section L

### ***H. Authorizing Signature***

  
\_\_\_\_\_  
Rhea S. Suh  
Assistant Secretary for Policy, Management and Budget  
U.S. Department of the Interior

1/20/11  
Date